



Spatial analysis of heat-related mortality among the elderly between 1993 and 2004 in Sydney, Australia

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Abstract:

This study analyzed the geographical patterns of heat-related mortality among the population aged 65 and over within the metropolitan area of Sydney, Australia between 1993 and 2004, and evaluated the role of some physical and socio-demographic risk factors associated with it. The effect of temperature on all-cause mortality during unusually hot days was investigated using spatial analytic techniques, such as cluster analysis and spatial regression analysis. Generalized Linear Models (GLMs) were used to investigate the role of daily average temperature, ozone (O₃) and particulate matter of diameter less than 10 µm (PM₁₀) at the regions that showed a significant increase in mortality on unusually hot days. Spatial variation in mortality on unusually hot days was observed among the population 65 and over. Elderly people living within 5–20 km south-west and west of the Sydney Central Business District (CBD) were found to be more vulnerable. However, analysis using GLMs showed temperature to be a significant modifier of daily mortality in the region to the south-west of the CBD only. O₃ and PM₁₀ were found to be non-significant factors in the regions where air pollutants were studied. Socio-economic status and the proportion of vegetation or developed land in each Statistical Local Area (SLA) were also not a significant factor explaining the increased mortality. A combination of social and environmental factors may be at play. Our results suggest an effect of temperature on mortality of the elderly population in Sydney Statistical Division at the SLA level. More spatially-based research would be beneficial once climate datasets with improved spatial coverage become available.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

Climate Change and Human Health Literature Portal



resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact:

specification of health effect or disease related to climate change exposure

Injury

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Elderly, Low Socioeconomic Status

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content